



**UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/147,325	02/17/99	LEIJON	9847-0001-EX

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EXAMINER
ENAD, E

ART UNIT
2834

PAPER NUMBER

DATE MAILED: 05/04/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/147,321

Applicant(s)
Leijon et al.

Examiner
Enad, Elvin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 03-29-01 and 04-05-01

2a) ☒ This action is **FINAL**.

2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 77-153 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 77-153 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☒ The proposed drawing correction filed on Mar 29, 2001 is: a) ☒ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other: _____

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DETAILED ACTION

Information Disclosure Statement

1. Receipt is acknowledged of the information disclosure statement papers filed on March 10, 2000 and March 21, 2000. The papers have been placed in the application file. A signed copy of the IDS will be provided when application is allowed.

Specification

2. A substitute specification including claims was received on November 27, 1998 and has been entered. Applicant is reminded that a substitute specification filed under 37 CFR 1.125(a) must only contain subject matter from the original specification and any previously entered amendment under 37 CFR 1.121. If the substitute specification contains additional subject matter not of record, the substitute specification must be filed under 37 CFR 1.125(b) and must be accompanied by: 1) a statement that the substitute specification contains no new matter; and 2) a marked-up copy showing the amendments to be made via the substitute specification relative to the specification at the time the substitute specification is filed.

Claim Rejections - 35 USC § 112

3. The rejection of claims 91,93 and 124 under 35 U.S.C. 112, first paragraph is withdrawn.
4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any

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person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 77,117,119 and 153 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claims 77,119 and 153 there is no support for the new limitation which recites that the stator winding form a "continuous full turn winding".

In claims 77,117 and 119, there is no support for the new limitation which recite that the solid insulation layer is in "electrical contact" with the first conducting layer and with the second semiconducting layer.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 77-84,87-93,103-112,116-125,127,129,130,136 and 153-158 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Elton et al. (USP 4,853,565) and further in view of Wood (British Patent 1,135,242).

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Shildneck discloses the claimed invention except for having his cable winding comprised of at least a semiconducting layer around the conductor and having a support member positioned in contact with the winding. Shildneck discloses an improved continuous winding for an electromagnetic device such as a large turbine-driven generator, the winding employing an improved form of flexible insulated conductor for the laminated armature core of the dynamo electric machine.

Elton et al. teach that it is known to have an electrical cable comprising an internal grading layer of semi-conducting pyrolyzed glass fiber layer in electrical contact with the cable conductor. Elton et al. teach having his electrical conductor comprised of a solid insulation layer **106** between two semi-conducting pyrolyzed glass fibers **104**, **110**, the internal grading layer **104** surrounding the conductors of cable **100**. In another form of embodiment, Elton et al. teach an electrical cable provided with an exterior layer of internal grading layer of semi-conducting pyrolyzed glass fiber layer in contact with an exterior cable insulator with a predetermined reference potential.

Wood teaches an improvement of packing means for conductors in stator slots of a dynamo-electric machines. The packing means is suitable for high power generators and is inflatable with a pressurized fluid medium. Furthermore, the packing means exert pressure resiliently against the conductors, both radially and tangentially, consisting of inflatable tubes extending axially along each slot or connected to a common manifold. The use of inflatable packing means facilitate insertion and make it possible to achieve compressive resilience to compensate for any shrinkage of conductor isolation. Wood further teaches that the packing

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means can be either connected to a supply of pressurized fluid medium by means of a common manifold or if the fluid medium is elastically compressible, each packing means may be sealed at both ends after inflation. The elastically compressible medium can be made of elastomeric material such as silicone rubber.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a cable winding similar to the one taught by Elton et al. to the dynamo electric machine of Shildneck, the winding employing a semi-conducting layer since such a modification according to Elton et al. would prohibit the development of corona discharge and would equalize the electrical charge generated between two layers. Moreover, to have placed support members with the winding as taught by Wood to the winding arrangement as disclosed by Shildneck would have been obvious since such a modification according to Wood would restrict movement of the conductors in the stator slots.

8. In regard to claim 78, having the semiconducting layer the same coefficient of thermal expansion as that of the insulation layer would have been obvious to one having ordinary skill in the art since it was known that having the expansion rate between two layers the same would be desirable in order to prevent cracking of the insulation and reduce wearing between the two.

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9. With regard to claim 80, it is noted that in pages 2 and 4 of the specification, applicant readily admits that the concept of connecting generators directly to a power network without intermediate transformers is known and possible using superconducting rotors.

10. Claims 85 and 86 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Elton et al. (USP 4,853,565) and Wood (British Patent 1,135,242), as applied 79 above, and further in view of Mazzorana (French Patents 2,594,271 and 2,556,146).

Shildneck in view of Elton et al. and Wood disclose the claimed invention except for a teaching of varying the stator slot shape and cross-section. Wood as seen in figures 1-5 teaches various configurations in positioning his pressure elements.

Mazzorana as seen in figures 1-5 teaches various ways of forming the slot shapes and its cross-sections.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the teachings of Mazzorana and to have modified the slot shapes and cross-section of Shildneck according to the design requirements. Furthermore, it has been held that a mere change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). In the instant application, applicant has not presented any argument nor provided teaching that the particular configuration selected is

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significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious.

11. Claims 94-102, 126, 128, 131-135, 137-144, and 148-152 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Elton et al. (USP 4,853,565) and Wood (British Patent 1,135,242), as applied to claims 88 and 89 above, and further in view of Grant (USP 5,325,008).

Shildneck in view of Elton et al. and Wood disclose the claimed invention except for having a corrugated sheet as a pressure member formed either in a longitudinal direction of the cable or surrounding the cable.

Grant teaches an installation and method of installing a constrained ripple spring assembly with a debondable adhesive. Grant teaches the ripple spring is adhesively secured to a flat surface, the spring mounted in the slot next to the winding and at a predetermined elevated temperature, the adhesive bonding is broken. The spring expands into a natural corrugated shape to apply a loading against the wedges and the winding.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the ripple spring assembly as taught by Grant as pressure members to the device of Shildneck in view of Elton et al. and Wood since such a modification according to column 2, lines 19-22 of Grant would provide loading which tightens the arrangement of the windings, filler strips and wedges in the slots.

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12. Claims 113-115 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Elton et al. (USP 4,853,565) and Wood (British Patent 1,135,242), as applied to claims 103 above, and further in view of Siemens (German Patent 468,827).

Shildneck in view of Elton et al. and Wood disclose the claimed invention except for the stator comprising of slot(s) having a profile with respective wide parts and narrow parts.

Siemens teaches that it is known to have a stator having cylindrical opening winding slots with decreasing radius in order to accommodate the winding conductors having varying diameters.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the stator slot arrangement as taught by Siemens and to have modified the stator slot arrangement of Shildneck since such a modification according to column 1, lines 25-29 of Siemens would accommodate conductors having varying diameters and would appropriate for the different potentials occurring with respect to the low potential end of the windings.

13. Claims 145-147 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Elton et al. (USP 4,853,565) and Wood (British Patent 1,135,242), as applied to claim 136 above, and further in view of Madsen (USP 3,932,779).

Shildneck in view of Elton et al. and Wood disclose the claimed invention except for a teaching of a method of inserting the support element as claimed.

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Madsen teaches a turbo-generator comprised of rotor winding including a plurality of slots and wedges inserted, a plurality of relatively thin pressure tubes of a deformable material positioned in the slots. The pressure tubes are supplied with a thermosetting resin through feed tubes, the resin being supplied at a sufficient pressure and in a sufficient amount to produce an expansion of space within the tube. The feed tube is then subjected to heat in a localized area forming a plug after which the supply of pressure to the pressure tube is removed. After the resin in the pressure tube has hardened, the feed tube is removed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the teachings of Madsen in forming the support element as provided by Wood, since such a method according to column 1, lines 43-46 of Madsen is reliable and could be performed without the use of hydraulic means.

Response to Arguments

14. Applicant's arguments filed on March 29, 2001, and the Declaration and Affidavit submitted under 37 C.F.R. 1.136 on April 5, 2001, by Mr. Robert Hirt and Mr. Robert Fenton have been fully considered but they are not persuasive. In response to examiner's office action on September 29, 2000, applicant has amended independent claims 77, 117, 119 and 153 and some of their respective dependent claims.

Applicant and the declaration by Robert Hirt and Robert Fenton provided various arguments as to why the combination of the referenced prior arts were not obvious, such as the

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references failing to teach or suggest motivations for combining. Applicant asserts that Elton et al. ('565) disclose generally the use of semi-conducting layer for insulated electrical conductors in various embodiments and applications. Moreover, applicant argues that in Elton et al. ('565) the conductors of the dynamoelectric machine are referred to as "bars", and when referring to an electrical cable for carrying high voltage, Elton et al. ('565) refer to the conductors as "cable" not as a "winding" or "bar". Applicant concludes that the conductor in Elton et al. ('565) relates to an electrical cable for transmission and distribution of electrical power and not for a winding of a dynamo electric machine. Applicant further argues that these are separate applications utilizing a common component and that Elton et al. ('565) do not teach the cable and the winding to be interchangeable.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Elton et al. ('565) clearly suggest that while the embodiments or examples illustrate only electrically grounded insulation bodies in combination with the semi-conducting layer, any one having ordinary skill in the art will appreciate that "any body having a known electric potential may be coupled to the semi-conducting layer to eliminate the effects of ambient

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electrical fields or charges developed within or without the electrical conductor or encompassed components.” (See column 8, lines 14-25).

Elton et al. ('565) provided three distinct embodiments utilizing a semiconducting layer, namely, in windings of a dynamoelectric machine, electrical cables and electrical housing surrounding a digital electronic equipment. In all applications, Elton et al ('565) teach that when the semiconducting layer is in electrical contact with an electrical ground, the layer prohibits the development of a corona discharge and bleeds off any electric charge developed on the exterior surface of an insulated conductor, (see column 7 lines 64 through column 8, lines 1-25).

It is important to note that the thrust of the invention of Elton et al. ('565) is the use of a semi-conducting layer material with an insulated conductor. In the art of motors, and as recognized by Elton et al., the problem of corona discharge in dynamo electric machines is commonly known and ever present. Elton et al. describe this problem of corona discharge developing whenever an electrical potential exists between the conductor and the region adjacent the exterior surface of the insulator. The stationary armature core are generally made of laminations which define circumferentially spaced radial slots opening into the bore. Disposed in the slots are heavily insulated electrical windings causing a high electrical potential to exist between the windings or armature bars and the members of the stator defining the slots which are at an electrical ground. Accordingly, when the semiconducting layer is in electrical contact with the electrical ground, the layer prohibits the development of corona discharge and bleeds off any electric charge developed on the exterior surface of an insulated conductor.

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Since other variations of dynamoelectric machines exist such as the ones disclosed by Siemens and Shildneck which utilize rounded cables for its windings in the stator core, why would one skilled in the art not apply the semiconducting layers and modify the existing cable to solve an existing and known problem? Or why would one skilled in the art not utilize a cable similar to the one disclosed by Elton et al.?

In response to applicants and Mr. Fentons argument in paragraph number 37 that the combination of Shildneck, Elton and Wood is not obvious since there is no motivation to put the different pieces of art together, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Examiner disagrees with applicant's argument that the cable of Elton et al. ('565) is stiff due to the presence of the semiconducting layer made of pyrolized glass layer. The rigidity of a conductor cable primarily depends on the type of insulation used. Shildneck for instance, in column 2, lines 28-30 teaches that the rigidity of the conductor bars depend on the type of insulation used. Shildneck uses silicone-rubber insulation for his flexible cable. Moreover, as is known in power cables, cable flexibility primary depends upon the use of ethylene-propylene (EPM) and ethylene-propylene-diene (EPDM) rubbers as insulation rather than of the semi-conducting layer. In addition, Elton et al. ('565) in column 8, lines 3-9, teach that the semi-

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conducting pyrolyzed glass layer can be chopped, mixed with resin and molded or blown on any complex shaped substrate so that the layer can be placed in intimate contact with substantially all of the exterior surface of the insulator or housing. As such, the semi-conducting layer can be shaped or molded according to design, in this instance, with a cable without causing cable rigidity.

Applicant and Mr. Fenton in paragraph 40, pages 17-18 of his declaration, argues that device of Shildneck is not designed for high voltage application. According to Mr. Fenton, Shildneck describes a conventional low-voltage, high current machine and does not even consider the problems existing in high voltage machines. Examiner respectfully disagrees with this observation. Shildneck in columns 1 and 2 readily discussed the disadvantages and limitations of generators utilizing rectangular conductors or "bars" versus the benefits of using a flexible cable-type of winding. It is common knowledge that motors/generators utilizing rectangular conductors or "bars" are primarily designed for high voltage applications.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elvin Enad whose telephone number is (703) 308-7619.

17. Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. The fax phone number for this Group is (703) 305-3431 (32).



Elvin Enad
Primary Examiner
Art Unit 2834
05.03.2001